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ELEATIC MOTIONS
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1. This paper is a sequel to "Parmenides Unbound," 1980. Its purpose is to show that objections to the view of Parmenides's philosophy argued for therein cannot be derived from what is known of Zeno of Elea and Melissus of Samos.

2. Summary of "Parmenides Unbound." — Parmenides scholars fall into two camps: the Majority, who hold that the contrast between the Aletheia and Doxa parts of the poem is the simple one of True to False; and the Minority, according to whom the opinions of mortals were put forward as possessing some kind or degree of cognitive validity. The paper defends the Minority position.

It is incredible that Parmenides, or anyone, should have held that all motion and plurality are mere illusion, for a direct consequence would be that Parmenides himself was an illusion: "I think, therefore I am not." This would be an especially strange pronouncement coming from one who asserted that thought and being are the same thing.

The text happily does not force us to this conclusion. The goddess denies "true confidence" (pistis alēthēs) to Doxa, but that need mean no more than that it is not logically guaranteed. Nor is Doxa anywhere identified with the Way of What Is Not, or of "two-headed mortals." The total number of Ways being unspecified, Doxa must be a distinct one. [I am now convinced that I was wandering down the wrong path; I should have taken Untersteiner's bold line that Doxa is at the end of the Way That Is.]

The crucial passage is B 8, 34-41, which in Tarán's typically Majority translation reads:

It is the same to think and the thought that [the object of thought] exists, for without Being, in what has been expressed, you will not find thought; for nothing other, besides Being, either is or will be, since Destiny fettered it to be whole and immovable; therefore, all that mortals posited convinced that it is true will be /mere / name, coming into being and perishing, to be and not to be, change of place and exchange of brilliant color.

The words underlined translate: half of line 38, tōi pant' onom(a) estai, which contains no warrant for the derogatory "mere." Moreover, tōi, as Woodbury observed, can be a dative pronoun, "for it"; with the variant reading onomastai we will have not a relegation of the entire mortal vocabulary to the status of flatus vocis but an assertion that its terms apply ultimately to What Is (to eon).

This rendition of tōi is obligatory, since certainly in Plato's (slight mis-) quotation in Theaetetus it must be taken so. Cornford's attempt to show that the Plato line is really a separate fragment does not succeed. Moreover, read this way the passage as a whole becomes a valid argument instead of a "summary" or a non sequitur.

Parmenides's accomplishment was the making of the fundamental philosophical distinction between what is known certainly by pure reason and on the other hand the domain of (mere?) experience. This is the ancestor of ideas/sensibles, form/matter, a priori/a posteriori, mathematics/physics, and substance/mode. But not reality/-appearance.

3. Casertano. — Unbeknownst to me, when I was writing "Parmenides Unbound" Giovanni Casertano of the University of Naples already had in press his book Parmenide il metodo la scienza l'esperienza, a thorough and scholarly exposition and defense of

the Minority position* which at last leads Parmenides studies eis phaos. Like me

*But evidently not a Minority in Italy: he says, p. 107, that the true-false contraposition of Aletheia-Doxa is "today rejected unanimously by almost all scholars"!

he acknowledges indebtedness to the work of De Santillana, virtually ignored in this country Great Britain and Germany, but not in Italy.

ZENO

4. Plato's Account of Zeno. — Our solidest information about Zeno is furnished by Plato in the Parmenides.* We learn there that Zeno's attachment to Parmenides was

*The reliability of the account, questioned by Solmsen, has been vindicated by Vlastos (1975), who however made one concession — unnecessarily, as we shall see.

peculiarly intimate and that he wrote a book while still a young man for the purpose of defending the Master's teaching that One Is (hen esti) against those who "tried to make fun of it" (epicheirountas auton komōidein), his method being to show that "the hypothesis that 'many are' would suffer even more ridiculous consequences if followed out far enough" (eti geloiōtera paschoi an autōn hē hupothesis, ei polla estin, ... ei tis hikanōs epexioi). The first argument in it went: "If things (onta) are many, the same thing (on) is like and unlike; but it is impossible for the same to be like and unlike; therefore the things are not many." (127E*)

*DK do not print the sentence just quoted as a fragment or even as a testimonium, even though they print 127A-D (just before it) and 128B-E (closely following); why I do not know, since Plato has Socrates say explicitly that the sentence is quoted from Zeno's book.

Who were the people who tried to make fun of the Master, whom Zeno intended to "pay back with something left over"? (128D) Were they plain men,* or were they, as

*The very notion of a philosophical argument, especially a reductio, aimed at "ordinary opinions" is dubious. Reductio requires a premise to be reduced, and plain men do not deal in premisses. In the history of philosophy there have been a few — not many — occasions when philosophers have attempted this enterprise, by supplying the putative plain man with premisses. They have not been notably successful. Hume for example asserted that plain men hold that "perceptions are their only objects," a view which he then proceeded to demolish, to his own satisfaction, by showing that "the slightest philosophy" — viz. pressing one eyeball with a finger — shows it to be false. But the plain man, so far from assenting to "perceptions are my only objects," does not have the slightest notion what that utterance means. And if told that what is involved is this: "When you press one eyeball, you see two 'tables'; but you know there aren't really two tables out there; so what you see can^{not} be even one real table," he will not be convinced. Only philosophers — who have perhaps been so incautious as to assert explicitly that what is given in the visual field is identical with what is seen — will find themselves embarrassed. It is so with Zeno's opponents, whoever they were. If plain men, the reply to "If things are many, then they must be both like and unlike" would only be — and quite appropriately — "Huh?" One might be taken aback if and only if one had previously and explicitly assented to some such unqualified generalization as "It is necessarily impossible for any adjective, and the adjective with negative prefix, to apply to the same thing." A philosopher might commit himself to such a formula and feel himself bound to defend it; a plain man would not think of it, and if it were proposed to him, he would regard any observation like "Then the same thing can't be both like a shoe and unlike a ship?"

as sufficient reason not to buy it in the first place.

some people nowadays like to say, professional philosophers? Some evidence bearing on this question can be gained from the dialogue including the mise en scène.

Zeno began his reading (so Plato says) before an audience of three: Socrates and two unnamed others. Later they were joined by Parmenides, Pythodorus, who later became a general but at that time was a paying student of Zeno (according to Alc. I, 119A); and Aristoteles, later of the Thirty Tyrants. Not counting Parmenides, then, the audience of five contained two persons of special interest in philosophy and three others whose reasons for being there we do not know. Pythodorus had heard it before. The very tininess of the audience reminds us of philosophical meetings today where a few people turn out to hear a not very well known visitor; quite unlike the setting of the Protagoras for example.

The Parmenides is a work of fiction of course. Yet as Aristotle said and Plato knew, fiction must conform to the probabilities.* What Plato chooses to say about this

*That Plato was consciously attempting to give a realistic portrayal of the Eleatics — consequently of their mission and to whom it was directed — is indicated by the statement that Zeno had been Parmenides's paidika, a detail that aroused the prudish wrath of Athenaeus five centuries later. (DK 29 A 11) He declared it schetliōtaton of Plato to mention it, which no doubt it was; but pseudestaton, added by Diels, is perhaps the only emendation made by the great editor where righteous indignation got the better of scholarly caution.

meeting, which perhaps never occurred, tells us all the more about what Plato conceived to have been Zeno's situation in his own time. And to repeat, if Plato was misinformed about these matters, then we know nothing at all about Zeno.

To this extent, then, the setting is in keeping with a view of Zeno's intended audience as consisting of people with a special interest in rather esoteric philosophical matters, not a representative sample of ordinary Athenians.* This impression is

*Pericles is said to have heard Zeno. But Pericles was hardly an ordinary Athenian, in philosophy or anything else. The remark in the Funeral Oration, "philosophoumen aneu malakias," is if genuinely Periclean the earliest recorded use of the word philosophy by an Athenian; as well as an indication that philosophizing was thought at least by some people somewhere in Greece to be an activity that real men would not take up.

reinforced if we turn our attention to the argument Plato purports to extract from his book. Would plain men make fun of someone who assured them that onta are not many, only one? Perhaps. Would they be thrown into confusion and consternation if the interlocutor then rebutted: "You say there are shoes and ships? Then the shoes are like each other and unlike the ships? Then both like and unlike? Now who's being absurd? So the joke is on you!" There is no reason at all to suppose that a fifth century plain Athenian would be any more susceptible to this kind of hectoring than would a twentieth century American. The flies are not born in the fly-bottle.

The argument that Plato sketches is at any rate of the type he ascribed to Zeno, a reductio ad absurdum. If many are (this is the premise of the opponents who are to be made to appear even more ridiculous), then they will be both like and unlike (which is supposed to be absurd). There is no suggestion that the same "absurd" conclusion would follow from the Parmenidean premise that One Is. This point may seem too obvious for mention, but we shall have occasion to return to it.

Fragments 1 to 3, preserved by Simplicius and assigned by DK to Zeno's On Nature, are clearly from the book referred to by Plato, all being deductions of contradictions from the hypothesis polla estin. Like Plato's exemplar they have bite only for the philosophical sophisticate who has already given some consideration to questions of carrying processes to infinity. Without some background of the sort

no one could even know ~~what~~ was being asserted and denied, much less assent to it or reject it. And again, they purport to follow only from the premise of many, not from the Parmenidean premise.

5. Zeno's book. — We are told by Proclus (29 A 15) that Zeno's book contained forty arguments. Whatever the exact number, some questions we face are: whether the arguments about* motion were in the same book; were offered in defense of Parmenides and if so

*Sic: logoi peri kinēseōs. The question-begging phrase "arguments against motion" found in so many modern discussions has no testimonial warrant.

how; were arguments from the opponents' premisses, and if so what those premisses were; were reductions of those premisses; and if so what the absurd consequences were supposed to be.

6. In what book did Zeno publish his arguments about motion? — All of Zeno's arguments must have been in the book referred to by Plato if Zeno wrote only one book. And that is the impression we get from Plato's description: nothing is said or hinted of any writing by Zeno except the one under consideration, and this at a (dramatic) date when Zeno had already had plenty of time to follow up his early piece if he had seen fit. This is one reason for the widespread reluctance to credit the testimony derived from Hesychius that Zeno wrote four books: Wrangles, Against the Philosophers, On Nature, and Examination of Empedocles's Philosophy. (29 A 2) Another is that this (sole) notice is very late, almost a millennium after Zeno's time. It has been suggested that the first three titles all refer to the same book.

We can leave out of consideration the putative book on Empedocles, which if it existed would hardly be the locus of the arguments about motion. If there were two other books besides the one mentioned by Plato, and if the motion arguments were in one of them, we could then not be certain that what Plato says about Zeno's method and purpose would apply to the motion arguments: that is, they might not be reductions, or they might not be directed against the thesis that Many Are, or they might not argue on the basis of that thesis, or they might not be intended in support of the views of Parmenides.

All these possibilities strike me as unlikely, but I cannot disprove them. However, there is no need to do so. If Zeno in them was not arguing in defense of Parmenides but for inscrutable purposes of his own, then they would be irrelevant to the question of what Parmenides held, hence could not count against the Minority position. That is to say, the hardest case for the Minority is that in which the arguments about motion are in the same book with the argument quoted by Plato about like and unlike, i.e. are intended to refute the thesis that Many Are by showing that it leads to consequences even more absurd than those drawn from Parmenides by his opponents. I shall therefore consider only this possibility.

7. Where, on the Majority view, the arguments about motion must have been published. — The orthodox Majority view of the four arguments about motion is that each of them purports to derive a contradiction from the assumption that motion occurs, thereby showing that motion cannot occur; if it seems to happen that is illusion. Support is thus extended to the doctrine of Parmenides according to which What Is is immobile in the bonds of mighty chains, etc.; the moon wandering across the night sky, the divinity sending female to male, et al., are merely mortal Doxa in which there is no truth.

But if this account is correct, then these arguments must have been published in a book other than the one Plato mentions, for this would be a quite different type of defense of Parmenides from the reductio. The people who made fun of Parmenides did so because he said things that to them were ridiculous, presumably such as "Nothing moves." According to the orthodox view, all the four arguments purport to do is prove this very same ridiculous proposition all over again. It would be very

strained to describe this procedure as "giving them back as much and more, showing their hypothesis to lead to even more ridiculous consequences." Furthermore, on this interpretation the arguments can hardly be seen as offered in support of the doctrine that One Is — a circumstance that led Vlastos indeed to accuse Plato of having grossly misrepresented Zeno's intent in this respect (only); in his indignation he even writes of "the junkheap to which [this testimony] belongs." (1975, p. 149)

Nor would anyone, at least any man in the street, not convinced by Parmenides's (supposed) arguments against motion, assent to Zeno's. Plainly, motion occurs; therefore in any argument with the conclusion that it doesn't, there must be a fallacy lurking somewhere, even if I am not clever enough to spot it; this must be the response of any plain man, and especially of any plain man who made fun of Parmenides. Greeks at large, in the infancy of dialectic, could hardly be so bemused by it as to be thrown into doubt and embarrassment about whether the lips of the man enunciating the premisses were indeed moving.

The Majority then are confronted with this dilemma: Either the arguments "against" motion occurred in a book other than that mentioned by Plato -- and then what role if any they had in defense of Parmenides's doctrine is unknown; Or they were in that book — in which case Plato has misrepresented the character of the book in at least two respects: it could not have been devoted entirely to defense of the thesis One Is; and it could not have consisted entirely of arguments that turned the tables on the ridiculers of Parmenides by showing that their own views led to even more ridiculous consequences. And if Plato's testimony is discredited, then we do not know what Zeno was up to, and nothing attributed to Zeno can be held to elucidate any Parmenidean doctrine.

8. The Tannery interpretation. — Since these consequences of orthodoxy seem unsatisfactory, let us examine the heretical exegesis that goes back to Tannery. On this interpretation nothing was farther from Zeno's thought than the denial of motion; on the contrary, "motion can't occur" was precisely the super-ridiculous consequence that he showed the ridiculers of Parmenides to be logically committed to. These jesters were not plain men, people in general, partisans of common sense, but a particular sect of philosophers — Pythagoreans. And their doctrines, which formed the premisses of the Zenonian reductions, were not common-sense beliefs but the explicit view that What Is — the real world — is an aggregate of units: in other words, Many Are.

9. The Arrow and The Stadium. — If the world is composed of unit places, then a given stretch of the world must be composed of either a finite or an infinite number of them. If finite, that is, if a line segment (say) consists of a finite number of atomic places lined up one after the other, — the places being atomic in the sense that there are no lesser places that compose them, or into which the place is really divisible — then "the flying arrow is at rest." For motion must then consist in the successive occupation of each of the places in the line; there cannot consistently be said to be motion between one such place and the next. The conclusion, that motion is really a succession of states of rest and nothing else, may not be a self-contradictory proposition, but it is certainly "ridiculous."

The Stadium extracts an actual self-contradiction from the assumption: "half the time is double the time," if Aristotle's sketchy description of it is filled out (quite legitimately) with the assumptions that the units involved (the onkoi) are minimal places, that time is analogously composed of atomic instants — which are before and after each other, but within which there is no before and after -- and that motion consists in the successive occupation of adjacent places. It follows that there is a maximum conceivable velocity, namely one atomic place per atomic

instant. And it also follows that if two files of bodies move in opposite directions at maximum velocity past a row of stationary bodies, each body in the one file will pass two bodies in the other in the same time in which it passes one stationary body, and thus in the time taken to pass one moving body it will pass half a stationary body; and if that stationary body occupies just one indivisible spatial unit, that unit is divisible after all.

Vlastos (1966) combines Fragment 4 (from Diogenes Laertius), "What moves moves neither in the place where it is nor where it isn't," with Aristotle's account to give a slightly different version of the Arrow. The reason why the arrow cannot move in the place where it is is that this is "a place equal to itself," (kata to ison), and whatever is in a place equal to itself is at rest.

This version is thus reminiscent of Zeno's argument against place: "If place is something, what will it be in?" (29 A 24; Arist. Phys. 210b22) Aristotle thinks this argument (clearly of the vicious regress type) is "not difficult to solve," holding commonsensically that "place" is "like, 'in the Agora,' 'in the Lyceum'" (Cat. 2a1). This paper is in the Hyatt Hotel which is in Baltimore which is in Maryland which ... A regress, maybe even infinite, but benign.

It seems safe to say that Zeno would have been capable of formulating this rejoinder for himself; which seems a good reason to believe, again, that he was arguing not against "common sense" but against a more refined and philosophical conception of place. (Cf. e.g. ordinary and philosophical notions of knowledge, possibility, chance.) It is easy to see what that would be: place is precisely where the thing is, the perfect fit. Against that kind of conception the argument is effective.*

*Cf. the modern notion of a unit set, that is supposed to be distinct from its singleton member yet entirely constituted by its membership; and the anti-set argument, precisely similar to Zeno's, that in that case there must be no end of super-sets -- which, however, does not seem to faze the set lovers.

What could Zeno have had against places? Obviously, their plurality; more specifically, the view that the cosmos is the totality (aggregate) of places. (As is well known, but sometimes forgotten by translators, topos means place, not space in anything like the modern cosmological sense -- a notion for which indeed the Greeks had no word at all.) Space, as Kant and others have taught us, is a given manifold, not in any way a congeries of spaces.

To return to the Vlastos version of the Arrow: If we think of Place as an absolutely tight skin around the thing of which it is the place, and also as immobile (and of course no Greek ever contemplated the motion of a Place, any more than a modern set theorist contemplates the generation or destruction of a set), then it is not an arbitrary and unconvincing assertion that nothing can move (either in an instant or over any stretch of time you please) "in the place where it is." And even more obviously, not in the place where it is not. So, since (according to the Place theorist) it must always (at each instant and throughout every stretch of time) be in a definite place, it can't move. -- But that is absurd. -- Therefore Place is absurd.

Here is one instance -- we shall find more -- where it turns out that after all an argument allegedly "against" motion is really directed against plurality -- as we should have known all along, since Plato told us so.

Suppose that Zeno's argument of the Arrow was, as the Majority claim, a straightforward refutation of the common-sense belief in motion. And suppose the Vlastos reconstruction is correct.* Then the crucial premise is that "a thing cannot move in the

*Or suppose it was just as Aristotle states it, ... but what is that supposed to be? The Aristotelian texts (29 A 27; Phys. VI 9, 239b5, 239b30) present no argument at all, without the Diels Ergänzung.

place where it is" -- an altogether unappealing claim; why can't a dervish rotate in the

market-place? Zeno could not have turned the tables on the ridiculers of the Master by producing an argument with a premise that none of them would accept; nor, being no fool, would he have tried to do so.

The Stadium: It has been objected that the rather elaborate Tannery reconstruction depends on the addition of premisses without textual support anywhere. There is no evidence, we are told, that any Pythagoreans ever held time to be composed of minimal instants, or even that space was composed of minimal extensions, both of which are required to make the argument work. That is so, no doubt; though this is not a very daunting consideration against Tannery given the unsatisfactory state of our knowledge about Pythagoreanism. And in any case, the Tannery interpretation does not stand or fall with Parmenides's opponents having actually been Pythagoreans, though that identification must be overwhelmingly more probable than any other.

The main argument in favor of the Tannery version is again that on it Zeno turns out to have been a dialectician of great skill, whereas on the Aristotelian version the so-called argument is nothing but the well-nigh incredible blunder of supposing that it takes as long to pass a moving body as a stationary one; a view that Meno's slave would have rejected with scorn.

10. The One vs. The Many. — Before turning to the Dichotomy and the Achilles, let us ask what is at issue between those who hold that One Is and those who say Many Are? Page Vlastos this issue may have something to do with the arguments about motion, as Plato averred, if the arguments were contained in the book he told us about.

To a philosopher brought up in our times the dispute between Monists and Pluralists may look like a primitive instance of metaphysics in the bad sense, happily cleared up by the Aristotelian remark that to hen legetai pollachōs. Pluralists must admit that the universe is one whole, and Monists must agree that the one whole has many parts. Anybody but a fanatic from Elea will admit that one mile is divisible into 5,280 feet.

Let us assume that the whole we are talking about is extended, and that by division we mean a process of making a separation possible -- that is, after a division has been made we can, physically or at least in thought, remove one segment from the other segment; and if the division is done cleanly, everything that was in the thing before division will now be in one or the other of the segments -- we could subsequently put them back together, recreating the whole.

Is extension itself -- space -- divisible in this sense? Obviously not. It makes no sense to contemplate scooping out a cubic foot of space and putting it a yard to one side. Space is not divided, it is that within which division takes place. But any extended thing in space, whether material object or merely ideal construction, can be divided -- a process with various physical limitations as applied to material things, but in thought capable of being carried to infinity.

The path of a runner in a stadium may be taken as an example of something fitting the description. It is not exactly a "physical object," but neither is it mere extension -- it gets longer as the runner advances, we can speak of the first half as distinct and therefore separable in thought from the second half, and so on. And while there would be limitations to the divisibility of (say) a chalk mark marking his path, on account of graininess, the runner when he traversed the path went through every one of the infinity of points on the path. So even a Monist, if he is reasonable, will have to admit that things are divisible. There is then no issue left between Monists and Pluralists.

Isn't there? The runner's path may be taken as an example of a line -- not space itself but a line in space -- and the Pluralist avers that it is possible to divide it, in the specified sense, at any point, in thought at least. But this is a mistake: a line is not divisible, even in thought, into two segments which together contain all and only what was in the undivided line. Not, at any rate, a line thought of as a dense ordered set of points (a Pluralist conception). For the line has one and only one midpoint. Suppose now the line is divided in thought at the midpoint, and the

resulting segments separated in thought. The first segment will now contain all the points that were to the left of the midpoint, and none other; the second will contain all the rest. We now have two finite line segments, the first of which has a last point, the second has a first. Both points were in the uncut line, and they were distinct. Therefore there were other points — an infinity of them — between them; which have now been lost, contrary to the conception of "clean" division. Another way to put this is that the following direction for bisection of a line is impossible to carry out even in thought: Identify the midpoint; then move your knife along the line until you reach the point such that there are no more points between it and the midpoint; then make your cut. Note that the futility of this instruction has nothing to do with the time available for carrying it out, or on the structure of time. It is simply that the place we are looking for to insert the knife, the place where all the points on one side are in the first half of the line and all on the other side are in the second half and there are no points left over — this place does not exist. (It does not matter whether we decide to put the midpoint itself into the first or the second half.)

11. The Dichotomy and the Achilles. — The Dichotomy and the Achilles put this point in picturesque terms. If what there is between the runner and the goal, or Achilles and the tortoise, is a "many," an ordered dense set of points, then the point at which the goal is reached must divide the line into two segments, one of which contains all and only the points before the goal, the other all the rest (including the goal point). On the hypothesis of the Many, these constitute two really separable sets, so that the first has a last member and the second has a first member (the goal point). The arguments show that this condition is unsatisfiable because contradictory: there would have to be two members of the original set between which there were no others.

Fragment 3 shows that Zeno grasped the moderately sophisticated notion of the dense series: "ei polla estin, ... aei ... hetera metaxu tōn ontōn esti, kai palin ekeinōn hetera metaxu, ..." As far as I know, this passage is the first (surviving) explicit statement of its defining characteristic.

This is an argument against a Many; for the difficulty noted does not beset the adherent of One. The Monist is not disbarred from talking about the midpoint of the line, or about the infinite number of points (i.e. positions discriminable from each other in principle) that must be passed through by the runner. Achilles the Monist can catch the tortoise; for him there is no awful Void between the last point before he catches up and the point where he does. Points are only markers along the course; they do not constitute it.

On this exegesis one can give a possible answer to the question why Zeno included arguments against a "quantum" conception of space and time, and why they come after those against a pluralistic continuum*. Vlastos and others object to the Tannery reconstruction of Nos. 3 and 4 on the ground that there is no evidence for Pythagoreans

*I am assuming of course that Aristotle's explicit numerical ordering reproduces Zeno's, which seems reasonable in view of the fact that in mentioning numbers Aristotle is deviating from his usual practice in dealing with several arguments in a continuous passage: he seldom (ever?) numbers them but marks the boundaries only with "And again it is said" or some such phrase.

(or others) having held such views, at least as concerns time. One might add that a conception of space (or place) as an aggregate of finite minima was untenable at least from the time when irrationals were discovered, long before Zeno. So was not Zeno flogging a dead horse?

The suggestion is that the quantum horn of the dilemma was necessary to catch anyone who might argue (as perhaps some did) that regardless of the results of a priori mathematical analysis, space and time in fact are quantized.* It does not seem unlikely

*Berkeley and Hume are distinguished comparatively recent holders of this view.

that victims of Zeno's relentless dialectic might be driven to take up desperate positions. — That is, if he was arguing against the Many. If on the other hand he was trying to deny motion, as the orthodox maintain, he was indeed luein ou chalepon, as Aristotle superciliously remarked.

12. Vlastos rebutted. — Vlastos (1967 p. 376) summarizes the Tannery interpretation in six theses, of which he claims one is probably and the rest certainly false.

1. "Zeno's arguments were not directed against the common-sense belief in plurality and motion."

This, says Vlastos, is contrary to "the unanimous opinion of antiquity that Zeno was a faithful Eleatic. ... As such he could not but reject all current professions of plurality and motion — starting with those of the man in the street."

This enthymeme is conclusive if and only if its missing premise is true, namely that Parmenides himself rejected all current professions of plurality and motion — starting with those of the man in the street. And that is precisely the point at issue between Majority and Minority. Parmenides indeed held (so we of the Minority maintain) that to eon, of which alone we have well-rounded truth, admits of no plurality or movement; but he would have been as puzzled as Zeno if told that the sun and moon (objects of mortal conjecture) are neither mobile nor two.

Vlastos's argument on this point is two-edged. Granted, as of course we do, that Zeno was a faithful disciple of Parmenides, then any independent evidence in favor of the Tannery interpretation strengthens the Minority claim as to Parmenides. And such evidence abounds: the direct testimony of Plato that all Zeno's arguments were aimed at plurality, which Vlastos is forced to "consign to the junkheap," as well as all the circumstantial evidence that the arguments are profound and effective against technical mathematico-philosophical Pluralism though if considered as telling against the common notion that we can go from here to there, they are indeed fit for nothing but the most disreputable refuse disposal site.

2. The Pythagorean doctrine against which Zeno's arguments were aimed was "that all objects are made up of elements which were expected to combine somehow the properties of the arithmetical unit, the geometrical point, and the physical atom."

This, says Vlastos, is "probably false," on the ground that evidence is lacking that early Pythagoreans held it. (Vlastos's emphasis.)

The question cannot of course be resolved with certainty. However, the core of the Tannery interpretation that concerns us here is not the historical identity of Zeno's (i.e. Parmenides's) ridiculers, nor what in detail they held, but what Zeno's arguments were. The answer to the former question might help in answering the latter, but it is not indispensable. Indeed it can be the other way around: if we see clearly enough what Zeno's arguments were, we may be in a position to make quite legitimately inferences as to what doctrines his opponents held.

3. "These Pythagoreans thought that time and motion were similarly discontinuous."

While in his preamble Vlastos includes this thesis among the "certainly false" five, in discussing it he says only that it is "pure conjecture and most implausible," on the ground that "so abstruse a theory as the quantization of time and motion could not have been seriously entertained until well after the much less daring speculation of the atomic constitution of matter had become thoroughly assimilated by the philosophical imagination — that is, well after Zeno."

It is hard to know what to say in reply to this, for the "quantum theory" impresses me as quite naive, indeed what a priori would most likely be the first answer to suggest itself once the question of the structure of space and time had been raised, and (as I mentioned above) sunk without a trace by the discovery of irrationals (for it implies the proposition that every spatial interval is representable by a rational number); and I have no idea how to argue with someone who thinks otherwise. However, Vlastos also

is appealing to a supposititious law of development of thought according to which the more "daring" a speculation is the later it must be. To this there are a host of counterexamples, going right back to Anaximander's unsupported earth (followed by Anaximenes's pneumatic float and Xenophanes's "going all the way down") and theory of cosmic and organic evolution (followed by the steady-state universes of Heraclitus and Aristotle). But I may have a faulty sense of what is daring and what isn't.

Again, in any case the question who, if anyone, actually held the quantum theory is peripheral to the Tannery thesis. It may be that no one did, that it was a straw man (instead of dead horse) vanquished as a proleptic precaution.

4. Zeno's arguments as Tannery interpreted them were "clear, forceful, irrefutable -- even those in which nothing but simple paralogsms had been commonly seen."

Vlastos does not demur to this characterization of the Tannery reconstructions, but objects that an opponent who accepted the discontinuity premise of the third and fourth arguments would reject the infinite divisibility of the first and second, so what could have been Zeno's point in offering both kinds?

The reply that Zeno's four arguments as an ensemble constitute a dilemma to confute anyone holding any Pluralistic view seems obvious. Presumably Vlastos failed to consider it because of his antecedent conviction that the arguments were "against motion".

The fifth and sixth Tannery theses, which are about Zeno's influence on the subsequent history of mathematics, do not concern us.

Since Vlastos's demurrers constitute the most serious challenge to the Tannery interpretation, its survival of his objections (if it is judged to have done so) would seem to amount to its virtual establishment. Which in turn amounts to vindication of the Minority position.*

*Cornford is the only scholar known to me who holds that both Tannery and the Majority are right. I cannot imagine how he managed it.

13. The Millet Seed. -- If a bushel of millet in falling makes a loud noise, surely one millet seed in falling should make a small noise, and a ten-thousandth of a millet seed a still softer yet/^{not} non-existent sound. (29 A 29). -- Vlastos interprets this argument as an attack on the trustworthiness of the senses, which "could scarcely have come except from someone who was prejudiced against them to begin with -- as the Eleatics, and only they, are known to have been at the time."

No one can claim certainty about the point of this. However, one natural line of interpretation would see it not as an argument but as a counter-example to the central contention of Pluralism, that every whole is the sum of its (independent) parts. Thus the whole, the thud of the falling bushel, must be the sum of the micro-thuds of the individual falling seeds. But there are no such things -- as the sense of hearing, assumed to be reliable, tells us! Another blow is thus struck against division and separation.

MELISSUS

14. The Problem of Melissus. -- Only an Eleatic by courtesy, Melissus attributed to to son three properties that Parmenides did not explicitly assign according to the fragments and testimonies: feeling no pain, feeling no grief, and being bodiless; and one property, spatial infinity, that the Master explicitly denied. Thus inferences from Samian doctrines and arguments back to Elea are antecedently of dubious validity; only in desperation would a scholar rely on Melissus to tell what Parmenides meant. One is tempted to leave the collimation of Melissus and the Minority as an exercise for the student.

However, inasmuch as I have argued that Parmenides could not have held the

doctrine of the utter unreality of motion and change on the ground that nobody could have held it, it is incumbent on me to show that Melissus did not hold it either -- or at least that it is not certain that he did.

15. The Notorious Fragment 8. -- The trouble is all in Fragment 8, which is as follows:

(2) For if there were (ēn) many, they would have to be of the same sort as I at any rate say the one is (toiauta chrē auta einai, hoion per egō phēmi to hen einai). For if earth is (esti) and water and air and fire and iron and gold, and living and dead, and black and white and the others that men say are genuine (einai alēthē), if indeed these are (esti), and we rightly (orthōs) see and hear, each one has to be (einai) of the kind that it first seemed (edoxen) to us, and not to alter nor become different, but always be (einai) each as it is (estin); but it seems to us that the hot becomes cold and the cold hot and the hard soft and the soft hard and the living dies and comes to be (ginesthai) from the not living, and all these alter, and what was and what now is are nothing the same (ouden homoion), but iron being (eōn) hard when turned about on the finger is worn down, and gold and stone and everything that seems to be strong, and earth and stone come from water; so that it follows that we neither see nor recognize the beings (ta onta). (4) Now these do not agree with each other. For to those who say there are (einai) many having their own properties [reading idia] and shapes and strength, all seem to alter and change, as we gather from how they look every time (ek tou hekastote horōmenou). (5) So it is clear that we did not see rightly (ouk orthōs heōrōmen) nor did those many seem rightly to be (einai); for they would not have altered had they been genuine (ei alēthē ēn), but each would have been (ēn) just as it seemed. (6) But if something alters, being (to eon) is destroyed, not-being (to ouk eon) comes to be (gegonen). Consequently if many were (eiē), they would have to be just such as the one.

It cannot be denied that this looks like an assault on common sense, on belief in earth and water, iron and gold, and hot food getting cold when people are late for dinner; in favor of a strange teaching that none of these things and processes actually exists -- we "don't see right." Which is the Majority view.

16. Who were Melissus's opponents? -- But again, let us begin by asking who could have been the targets of Melissus's polemic. Who both (i) held that there are earth and water, and hot things cooling off, and (ii) might have been flummoxed by an argument purporting to show that such beliefs are incompatible with the conviction that what genuinely is must be eternally the same? The sailors who rowed the Admiral's barge might satisfy the first condition, but hardly the second. "This hunk of hardtack can't be real, because if it were it couldn't change by a hair's breadth in ten thousand years" would assuredly not strike them as anything but at best an incomprehensible piece of quarterdeck eccentricity.

Might it go over differently with anyone else? Well, who took pains to state explicitly the following platitude?:

The cold things warm up, warm cools off, damp gets dry, dry dampens. (22B126)
And who said:

Earth flows through as sea, and is measured in the same proportion as it had before it became (genesthai) earth. (22B31)

It is death for souls to become water, but for water it is death to become earth, but from earth water comes, and from water soul.

Fire lives the death of earth and air lives the death of fire, water lives the death of air, earth that of water. (22B76)

We live their death and they live our death. (22B77)

What there is sight hearing learning of, these I prefer. (22B55)

Melissus lived two or three generations after Heraclitus, but we have the testimony of both Plato and Aristotle for the continued existence of "Heracliteans" in his neighborhood who stressed the dynamism of the Ephesian philosophy evidently to the exclusion of Heraclitus's emphasis on underlying unity, which was no less central in his thought than in Parmenides's. If Parmenides and Heraclitus had met, there would have been little occasion for them to quarrel; but it would be natural for their epigones — Melissus, and people like Cratylus — to attack each other. Moreover, if the elaborate account in Theaetetus has the slightest basis in fact, the Heracliteans of the later fifth century had a particular interest in sense perception, which both revealed and was itself an instance of the unceasing flow of all things. Hence a special motive for their opponents to charge them with "not seeing rightly."

Since except for what we can glean from Theaetetus and from Aristotle's brief remark about Cratylus's having abandoned speech we know nothing of late Heracliteanism, it is impossible to reconstruct the particulars of Melissus's argumentative strategy. However, it is reasonable to suppose that these people, like all the Ionians of whom we have any knowledge and like all Greek philosophers with the single (possible) exception of Pythagoreans, clung to the principle Nothing from nothing, and that Melissus was trying to show that this commitment was incompatible with Everything flows, and that cycles would not save them.

17. What Reality Is. — The details of this speculation are not important. The main point, which seems hardly contestable, is that Melissus was like Zeno — and Parmenides himself — carrying on a discussion with other philosophers and not with the Greeks in general; and that therefore he could count on those to whom he addressed his writings to share certain assumptions, such as that nothing comes from nothing, and to be aware of certain technical usages, such as the Being (*esti*, to *eon*) sensu stricto (Loenen's term) of Parmenides. A study of Parmenides's poem will show that the participial form, to eon, is always used in this sense of what fundamentally, objectively, and absolutely exists on its own and is the object of — and in some way identical with — noein, which we might render as "the faculty of a priori insight". To eon does not appear at all in the Proem or in the meager fragments of Doxa.* Esti and other

*But neither does to me eon, and there is reason to hold that that damning epithet was not to be found in the entirety of the Doxa; see "Parmenides Unbound" 348 f. The plural ta eonta occurs nowhere, though Casertano gives the impression that it does.

forms of einai occur in all three portions, but when/^{they are}not merely copulative the context always makes it clear whether or not they are intended in the strict sense.

What is it that IS sensu stricto? Well, what is ungenerated, indestructible, one, all alike, unchanging, unmoving, indivisible, full, and "like the mass of a well-rounded ball"? De Santillana's answer to this riddle is: the Space of Geometry; certainly all but the last two of these epithets are applicable to that. Tannery said it was Cartesian extension, which was a plenum; and Casertano concludes that it is "the world, reality considered in its unity and totality" (p. 94). These perhaps fit better with the last two properties; but there can be little doubt, at any rate to the Minority, that to eon is at least geometrical space. The special status of Being assigned to it recognizes it as the domain of Pure Thought, which to Parmenides as to Aristotle's God is the greatest thing in the world and therefore must have a commensurately exalted object — so much so indeed that in the end it must be identical to what thinks it:

to gar auto noeinestin te kai einai.

In other words, Space thinks. To which Melissus adds as anticlimactic footnotes that it feels no pain nor grief.

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